

Unit 7 Review

In addition to knowing vocab definitions, be sure you can apply them to understand the following:

Ch 19

- Darwin, Descent with Modification, and Natural Selection
 - What individuals, observations, and ideas influenced Charles Darwin and in what way did they influence him?
 - What can the location of fossils tell us about different species?
 - What was Lamarck's hypothesis about evolution and how was it correct or incorrect?
 - How are artificial and natural selection alike and how are they different?
 - On what observations and inferences is natural selection based?
 - Who can evolve and over what time period?
 - How does natural selection work?
- Evidence
 - Explain examples that provide evidence for natural selection
 - What is the difference between homologous and analogous structures?
 - Be able to classify examples of each
 - Which do and do not provide evidence of common ancestry?
 - Be able to explain and identify examples of vestigial structures
 - How does the genetic code provide evidence for evolution?
 - What is convergent evolution, in what kinds of traits does it result, and what can it (or can it not) reveal about ancestry?
 - Where are endemic species most likely to be found?
 - How does a theory compare to a hypothesis?

Ch 20

- Phylogeny
 - Be able to create and interpret phylogenetic trees and cladograms
 - Who is the most recent common ancestor shown?
 - Who is most closely related in the tree?
 - Where on the tree did certain characters appear?
 - Again, what is the difference between homology and analogy?
 - Why is a 3 domain system used instead of the previously recognized 5 kingdoms?
 - What kind of evidence supports this classification system?

Ch 21

- Microevolution
 - On whom does natural selection act and how?
 - Who can evolve and when?
 - What mechanisms cause allele frequencies to change and how do they do so?
 - Which of these cases adaptive evolution?
- Genetic Variation
 - Why is diversity essential for evolution to occur?
 - What kinds of mutations would have the greatest vs least effect on the resulting proteins?
 - In sexual reproduction, most genetic variation results from what? How?
- Hardy-Weinberg
 - What does this principle state?
 - Does this apply to populations that are or are not evolving?
 - How can you use the equations to determine the frequencies of dominant and recessive alleles as well as various genotypes?
 - What are the 5 conditions that must be met for a gene pool to be considered in Hardy-Weinberg equilibrium?
- Genetic Drift and Gene Flow
 - How does genetic drift affect allele frequencies?
 - What types of populations does it most likely affect?
 - How does it affect genetic variation?
 - Explain the difference between the founder and bottleneck effects?
 - What factors can increase vs decrease gene flow?
 - How does gene flow affect allele frequencies?
 - How does it affect genetic variation?
- Modes of Natural Selection
 - What is the difference between directional, disruptive, and stabilizing selection?
 - How does each affect phenotypes?
 - Which favor one allele vs two or more?
 - Be able to classify examples of each mode
 - What is sexual selection and in what can it result?
 - What is sexual dimorphism?
 - What is the difference between intra and intersexual selection?
 - How does intersexual selection affect both survival and reproduction?
- Preservation of Genetic Variation
 - What mechanisms help preserve genetic variation and how do they do so?
 - How many alleles and/or phenotypic forms does balancing selection favor?
 - How is the fitness of various phenotypes affected by heterozygote advantage vs frequency-dependent selection?
 - ie-What phenotypes are favored under each type of selection?

Ch 22

- Biological Species Concept
 - How does the biological species concept determine when populations are considered separate species?
 - How does gene flow impact the development of new species?
 - What is the difference between prezygotic and postzygotic reproductive barriers?
 - Be able to classify examples of each of the following (and which are pre vs post):
 - Habitat isolation
 - Temporal isolation
 - Behavioral isolation
 - Mechanical isolation
 - Gametic isolation
 - Reduced hybrid viability
 - Reduced hybrid fertility
 - Hybrid breakdown
 - What are the limitations of the biological species concept?
- Other Definitions of Species
 - What is the difference between the biological, morphological, ecological and phylogenetic species concepts?
 - In what situations is one definition more applicable than another?
- Allopatric vs Sympatric Speciation
 - What is the difference between allopatric vs sympatric speciation?
 - From what factors can sympatric speciation result?
 - How can a sterile hybrid be changed into a fertile polyploidy?
 - If you know the diploid number of each species, how do you determine the diploid number of the allopolyploid?
 - Explain an example of how sexual selection can drive sympatric speciation
- Hybrid Zones
 - What is a hybrid zone and how does it affect gene flow?
 - What are the three possible outcomes when closely related species meet in a hybrid zone and what is the result of each?
 - How does each affect gene flow vs speciation?
- Timing of Speciation
 - How is punctuated equilibria defined in terms of time and change?

Ch 23

- Fossil Record
 - What types of rocks are the richest source of fossils?
 - The fossil record is biased in favor of species that meet what criteria?
 - How can the relative age of fossils be determined?
 - Up to what date can these processes be used?
 - What are the oldest known fossils and how far back do they date?
- Plate Tectonics
 - What effects did the formation of Pangaea have?
 - How did the break-up of Pangaea affect populations?
- Extinctions
 - What factors may have contributed to mass extinctions?
 - What consequences can result from mass extinctions?
 - What are adaptive radiations and when and where do they typically occur?
- Regulation of Developmental Genes
 - What impact does paedomorphosis have on the morphology of organisms?
 - What is the role of homeotic/hox genes?